

I communicated personally with the captain of the Netherlands frigate "Queen Emma" stationed on the spot, and was informed by him that the changes are considerably more extensive than was at first thought, and that Verlaten Island is still in a state of activity as well as Krakatoa itself.

From observation he thinks that another eruption is impending, but that Verlaten Island will be the centre of disturbance.

The Netherlands Government vessel "Hydrograaf" obtained a sounding of 100 fathoms without reaching bottom, in the centre of the group and off the cliff falling from Krakatoa Peak.

The two new islands are low mud and pumice banks, their configuration is continually altering, and I was informed that they are gradually subsiding.

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It is still impossible to examine Lampong Bay, but the pumice stone is now beginning to float out.

The light on Fourth Point (Java) has been temporarily replaced by one of the 6th order, visible five miles, but beside this there are no signs of life on the Java shore. The whole coast is covered with the *débris* of trees, &c., demolished by the earthquake sea-wave, and over all lies a thick incrustation of volcanic mud.

During the height of the eruption a terrific whirlwind and a fierce south-westerly gale, apparently local, was experienced.

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IV. Report from H.B.M. Consul at Batavia, inclosing Extract relating to the Volcanic Outbursts in the Sunda Strait, from the Logbook of the Steam-ship "Governor-General Loudon." Communicated by R. H. SCOTT, F.R.S. Received December 4, 1883.

Sunday, 26th August.—Left the roadstead, Batavia, at 8.10 A.M., and steered through the inside channel. At 9.30 A.M., steering between the islands Great Kombuis (or Lantjang) and Pulo Lakki (or Mometer or Cannibal Island), sighted the Kombuis red buoy due north, while at 10 A.M. the white Cannibal buoy lay due south. Rounded Point St. Nicholas, and taking our bearings from the land proceeded through Sunda Strait to the roadstead of Anjer, where we anchored at 2 P.M.

At Anjer we took on board 111 passengers, coolies and women bound for Sibogha, and left Anjer roadstead again at 2.45 P.M., and taking our bearings from the land we ran past Pulo Soengjan, or "Right in the Fairway" Island, past Hog Point and Lampong Bay, and then discovered that the island of Krakatau was casting forth enormous

columns of smoke. At 5 P.M. Pulo Tiga Island lay about half an English mile to the west of us. Were steering then N.W. $\frac{1}{4}$ N. (true bearing). At 6.15 P.M. the southernmost of the Chandon Islands was bearing north-east.

Laid the course next for the roadstead of Telok Betong, which we reached at 7.30 P.M., and where we anchored in six fathoms of water with thirty fathoms shackle outside the hawse-pipe.

From 6 o'clock we had rain of ashes and small bits of stone, and there was a stiff breeze from the N.W. and W.N.W.

Monday, August 27th.—Finding that at midnight on the evening of our arrival there was still no boat come off to us from the shore, and as the weather was now much calmer, I sent the first mate in the gig with a crew of six men to find out what was the reason of this. About 1 A.M. he returned, and stated that it had been impossible to land on account of the heavy current and surf; also that the harbour pier-head stood partly under water.

The Government steamer "Berouw," which lay anchored near the pier-head, hailed the mate as he was returning on board, and the people on board her then stated to him that it was impossible to land anywhere, and that a boat which had put off from the shore had already been wrecked. That by 6 P.M. on Sunday evening it had already begun to be stormy, and that the stormy weather had been accompanied by a current which swept round and round (apparently a sort of whirlpool). When the mate had come on board, we resolved to await daylight before taking any further steps; however, for the sake of security, we steamed several ships' lengths outwards, because the sound of a ship's bell which seemed to be approaching us made us suspect that the ship must be adrift, and wishing therefore to avoid a collision we re-anchored in nine fathoms with thirty fathoms shackle outside the hawse-pipe. We kept the ordinary sea-watch, and afterwards heard nothing more of the bell. When day broke, it appeared to us to be still a matter of danger to send a boat ashore; and we also discovered that a revenue cutter was foul of a sailing-vessel which lay in the roadstead, and that the "Berouw" lay very close in shore. Later we found that the "Berouw" was stranded. However, owing to the violent winds and currents, we did not dare to send a boat to her assistance.

About 7 P.M. we saw some very high seas, presumably an upheaval of the sea, approaching us up the roadstead. These seas poured themselves out upon the shore and flowed inland, so that we presumed that the inhabitants who dwelt near the shore must be drowned. The lighthouse was altogether carried away, and the "Berouw" then lay high upon the shore among the cocoanut trees.* Also the revenue

* And as far as ascertained since, every soul on board was killed. The steamer now lies two miles inland.

cutter lay aground, and some native boats which had been lying in the neighbourhood at anchor were no more to be seen.

Since it was very dangerous to stay where we were, and since if we stayed we could render no assistance, we concluded to proceed to Anjer under steam, and there to give information of what had taken place, weighed anchor at 7.30 A.M., and following the direction of the bay steered thereupon southwards. At 10 A.M. we were obliged to come to anchor in the bay in 15 fathoms of water because the ash rain kept continually growing thicker and thicker, and pumice-stone also began to be rained, of which some pieces were several inches thick. The air grew steadily darker and darker, and at 10.30 A.M. we were in total darkness, just the same as on a very dark night. The wind was from the westward, and began to increase till it reached the force of a hurricane. So we let down both anchors and kept the screw turning slowly at half speed in order to ride over the terribly high seas* which kept suddenly striking us presumably in consequence of a "sea quake," and made us dread being buried under them.

Awnings and curtains from forward right up to the mainmast, three-boat covers, and the uppermost awning of the quarter deck were blown away in a moment. Some objects on deck which had been lashed got loose and were carried overboard; the upper deck hatchways and those on the main deck were closed tightly, and the passengers for the most part were sent below. Heavy storms. The lightning struck the mainmast conductor six or seven times, but did no damage. The rain of pumice-stones changed to a violent mud rain, and this mud rain was so heavy that in the space of ten minutes the mud lay half a foot deep.

Kept steaming with the head of the ship as far as possible seawards for half an hour when the sea began to abate, and at noon the wind dropped away entirely. Then we stopped the engine. The darkness however remained as before, as did also the mud rain. The barometer at that time stood again at 763.25 millims. Sounded the pumps. No water. Let the crew and also such passengers as were on deck work at throwing the mud overboard. At 2 P.M. the barometer was 763.30. The mud rain changed into a light ash rain.

The darkness remained the same until the following morning at 4 A.M. At daybreak began to get the chain clear and weigh the anchor; got under steam at 6.30 A.M.; made out then Tims Island, bearing S. by W., and Pulo Soengal Island, bearing S.W. $\frac{1}{2}$ W. Held on our course for Pulo Tiga Island and fell in with much ash and drift-wood.

When we got about two English miles off Pulo Tiga, it appeared that a connexion had been formed between the islands just mentioned

* Or, as he says elsewhere, "Squalls, storms, and seas as high as the heavens."

stretching to Seboekoe Island, and thence to the mainland. Whether this connexion was formed out of solid ground or only out of pumice-stone and trunks of trees is not known. What is certain is, that at the distance at which we then lay, it looked exceedingly like solid ground, and so we thereupon turned back in order to look for another passage. The very same phenomenon as had revealed itself near Pulo Tiga was discovered also between Tims Island, Seboekoe, and Pulo Soenchal, and we, therefore, resolved to make our way out through the Strait of Lagoendie. This channel we found relatively clear, that is, in comparison with the other part of the bay. Having got outside we discovered that here also we were entirely shut in; so steamed very slowly, stopping every now and then close by the so-called layer, and made it out at last to be floating pumice-stone, through noticing that the layer was heaved up and down by the motion of the surf.

Now steamed somewhat faster, and when we got into the middle of the layer before referred to found it to be 7 or 8 feet thick. It took us ten minutes to get clear of it, and then we held our course south of Krakatau, the *serang** being in the fore-yard, a man on the look out forward, and the captain and first mate on the bridge.

Wednesday, August 28th, 1883.—As we steamed past Krakatau we noticed that the middle of the island had disappeared, and that no smoke was to be seen in any direction. However, when we got east of Krakatau† we discovered that between that island and Sebisie a reef had formed, and that various craters planted on that reef were now and then sending columns of smoke on high. As we neared the coast of Java we observed that here, too, everything had been laid desolate.

We also perceived that the lighthouse on Java's Fourth Point was entirely washed away; nothing remaining except a stump some feet high.

At 4 o'clock reached Anjer roadstead, and although there was nothing more to be seen of the place itself the captain and the first engineer went ashore to learn what information was to be obtained.

Ashore we met the Resident of Bantam, and concluded to return straight on board in order to convey his Honour to the roadstead of Bantam, and this because the Resident assured us that it was of very great importance in the public interest that such should be done.

We left Anjer Roads at 10 minutes to 5 o'clock, steamed round St. Nicholas' Point, and went on taking our bearings for the Island of Pulo Pundjang, and steering into Bantam Bay.

* *Serang* is a sort of boatswain.

† In another place he says also that, "Also half of the island 'Right in the Fair-way' had disappeared, and what is left of it has been broken into fragments with open spaces between them."

We arrived at our destination at 6.50 P.M.; by request of the Resident, put him on board a ship which lay in the roads there, and after having done this at 7.30 we got under steam again and made for Krooe (Benkoelen district).

T. H. LINDERMAN,
Master of the "Governor-General Loudon."

Additional Notes.

The telegraph buoys in the neighbourhood of Anjer may possibly have been somewhat shifted, but they were found not to have been carried away.

The town of Tjiringen (Java) has been destroyed.

At Anjer, besides many natives who are supposed to have perished, the Assistant Resident, the harbour master, and nearly all the other Europeans were destroyed.

The lighthouses at Java First Point and Flat Cape (Sumatra) are still standing.

At Padang from the afternoon of the 26th of August for the succeeding twenty-four hours re-echoing sounds made themselves heard like the noise of distant and heavy cannonading.

The air now and then was red-coloured, while during the afternoon of the 27th thirteen bores or tidal waves rushed up the harbour, the third and highest of these waves rising to about $\frac{1}{2\frac{1}{5}}$ th of a metre below the crown of the quay on which the harbour master's office stands.

The strength of these waves varied for the most part between that of a four-mile and of a six-mile current, but the third wave was estimated to be running at a speed of about twelve miles.

Beginning at 12.50 P.M. they recurred at intervals till nearly midnight. The average pause between the flow and the ebb of these waves was about four seconds.

It will be seen from the foregoing that three lighthouses are known to have been destroyed, viz., the harbour lights at Anjer and Teluk Betong, which were small, and the big lighthouse on Java Fourth Point.

It is worthy of note also that on the morning of the 27th of August before daybreak the master of the British steam-ship "Devonhurst," which was then off the North Coast of Acheen steering for Olehleh, was woken by a shock which led him to think that the steamer had stranded.

He rushed on deck to learn what had happened, but found his vessel in deep water in her usual course.

One or two superstitious ideas which revealed themselves among the native population in consequence of the disaster are not unworthy

of notice. Thus on board the "Governor-General Loudon" the mud rain* which covered the masts, rigging, and decks, was phosphorescent, and on the rigging presented the appearance of St. Elmo's fire. The natives engaged themselves busily in putting this phosphorescent light out with their hands, and were so intent on this occupation that the stokers left the engine-rooms for this purpose, so that the European engineers were left to drive the machinery for themselves. The natives pleaded that if this phosphorescent light, or any portion of it, found its way below a hole would burst in the ship: not that they feared the ship taking fire, but they thought the light was the work of evil spirits, and that if the ill-omened light found its way below the evil spirits would triumph in their design to scuttle the ship.

Recent telegrams from the scene of the disaster describe the native population as hostile, and inclined to attribute the catastrophe to the vengeance of heaven pursuing the Dutch for their conduct in Acheen. Such Europeans as escaped the eruption are now reported to be in danger of being murdered by the natives.

These accounts are, however, possibly exaggerated. The Dutch officials make light of them, and deny that there is any ground for political disquietude.

Krakatau Island before the eruption was 822 metres high.

Pulo Bessi, the neighbouring island, was 849 metres high.

The earthquake waves which deluged Anjer and the neighbouring coasts were two in number; the second was higher than the first, but the first was reckoned to have been 13 feet high when it touched the land.

There was an hour's interval between these two waves.

The shock of these waves (or of one of them) drove the ships and the dry-deck in Ourust Island, near Batavia, from their anchorage.

The earthquake wave was still as much as 6 feet high when it struck the shore at a place called Sembilangan Laoet, more than 2 English miles to the eastward of Batavia, and there it killed at least seven people.

At Tjiringen, on the Sunda Straits, the earthquake waves are reckoned to have killed 10,000 people, and it is also known that these waves have flooded the coasts further southward, as far as Paniembang river, in Pepper Bay (how much further has not yet been ascertained). To the eastward a reference to the map will show that the promontory ending in St. Nicholas Point, and which shelters Bantam Bay, is mountainous, containing two peaks, 640 and 634 metres high respectively.

Hence, as far as I can gather from the recent reports, the earthquake waves appear not to have done much damage to Bantam Bay,

* It is supposed to have been raining violently at the time; the rain mingled with the ash and formed the "mud."

but to have swept past St. Nicholas Point eastwards, with a slight direction south, and to have struck Tanara, a town near the coast on the river which separates the provinces of Serang and Batavia. In the Tanara district 704 corpses have already been found. The wave did immense damage at Kramat, a coast village about 2 miles eastward of Tanara, and killed many people there. It struck the land on the east side of the bay in which Batavia lays with a column of water, which was still 6 feet high; and somewhere about this district the force of the flood seems, as far as is at present known, to have expended itself.

The first eruption on Krakatau Island took place about the 23rd of last May, and continued at intervals for a day or two. It is not without interest to note that Captain Gibson, commanding the steamedredger "Crocodile," on its way to Australia, was, on August 21st, in latitude $7^{\circ} 30'$ S. and longitude $90^{\circ} 30'$ E. There he found his vessel amid great quantities of floating pumice-stone, some of which he brought on board and has preserved. He attributed the presence of this pumice-stone to some volcanic eruption, which he supposed had taken place among the Eastern islands.

The current at that time was setting westward, at the rate of about a knot and a half per hour. There were barnacles and shells on some of the pumice-stone, showing that it must have been for some time in the water. Most probably this was the *débris* from the May eruptions on Krakatau.

There may possibly be questions connected with the migration of animal or vegetable life, or with the duration and drift of oceanic currents on which the above incident may have an important bearing, or perhaps *would* have if it were possible to trace what ultimately became of the pumice-stone which was met with by the "Crocodile" travelling steadily westward, and which had already travelled so far.

In the neighbourhood of Anjer coral rocks more than six tons in weight were rolled by the sea far inland.

The corpses are so battered that it is often impossible to recognise whether the man was a Chinese or a Malay.

On the southern coasts of Java the flood waves rolled ashore, and did damage as far to the eastward as the province of Banjoemas.

In some places where the ash rain has choked the wells there is a scarcity of water.

(Signed)

H. G. KENNEDY,

Her Majesty's Consul.

September 13, 1883.